

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 26 June 2001 (26.06.01)	
<b>International application No.</b> PCT/EP00/09254	<b>Applicant's or agent's file reference</b> TS 0919 PCT
<b>International filing date</b> (day/month/year) 20 September 2000 (20.09.00)	<b>Priority date</b> (day/month/year) 21 September 1999 (21.09.99)
<b>Applicant</b> VAN DEN BORN, Isaac, Cornelis et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

20 April 2001 (20.04.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Zakaria EL KHODARY  Telephone No.: (41-22) 338.83.38
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# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>TS 0919 PCT</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/EP 00/ 09254</b>	International filing date (day/month/year) <b>20/09/2000</b>	(Earliest) Priority Date (day/month/year) <b>21/09/1999</b>
Applicant  <b>SHELL INTERNATIONALE RESEARCH</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

1



None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No.

P 00/09254

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 C10J3/52

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C10J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 086 931 A (TEXACO DEVELOPMENT CORP) 19 May 1982 (1982-05-19) ---	
A	GB 2 026 145 A (RUHRCHEMIE AG) 30 January 1980 (1980-01-30) ---	
A	EP 0 113 469 A (TEXACO DEVELOPMENT CORP) 18 July 1984 (1984-07-18) ---	
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 01, 29 January 1999 (1999-01-29) & JP 10 287886 A (BABCOCK HITACHI KK), 27 October 1998 (1998-10-27) abstract --- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \* & \* document member of the same patent family

Date of the actual completion of the international search

12 February 2001

Date of mailing of the international search report

19/02/2001

Name and mailing address of the ISA

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Authorized officer

De Herdt, 0

# INTERNATIONAL SEARCH REPORT

International Application No

P 00/09254

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EP 0 290 087 A (SHELL INT RESEARCH)            9 November 1988 (1988-11-09)            cited in the application            -----</p>	

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 00/09254

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2086931	A	19-05-1982	AU 541194 B	20-12-1984
			AU 7598081 A	20-05-1982
			BE 891102 A	12-05-1982
			BR 8105270 A	31-08-1982
			CA 1194696 A	08-10-1985
			DE 3144266 A	08-07-1982
			FR 2493861 A	14-05-1982
			IN 155417 A	26-01-1985
			IT 1139691 B	24-09-1986
			JP 1218369 C	17-07-1984
			JP 57096088 A	15-06-1982
			JP 58051987 B	19-11-1983
			NL 8104691 A	01-06-1982
			NZ 198407 A	06-07-1984
			SE 451727 B	26-10-1987
			SE 8106191 A	13-05-1982
			ZA 8106443 A	26-01-1983
GB 2026145	A	30-01-1980	DE 2829629 A	24-01-1980
			AU 528822 B	12-05-1983
			BR 7904201 A	25-03-1980
			CA 1147556 A	07-06-1983
			IN 152244 A	26-11-1983
			JP 1300327 C	31-01-1986
			JP 55012181 A	28-01-1980
			JP 60024832 B	14-06-1985
			NL 7808331 A, C	08-01-1980
			PL 216744 A	24-03-1980
			SU 993825 A	30-01-1983
			US 4381924 A	03-05-1983
			US 4425139 A	10-01-1984
			ZA 7903249 A	30-07-1980
EP 0113469	A	18-07-1984	US 4465496 A	14-08-1984
			DE 3371359 D	11-06-1987
			JP 59136389 A	04-08-1984
JP 10287886	A	27-10-1998	NONE	
EP 0290087	A	09-11-1988	DE 3714915 A	24-11-1988
			AU 599786 B	26-07-1990
			AU 1552588 A	10-11-1988
			CA 1336645 A	15-08-1995
			CN 88102581 A, B	16-11-1988
			DE 3860637 D	25-10-1990
			JP 2609533 B	14-05-1997
			JP 63286493 A	24-11-1988
			ZA 8803134 A	08-11-1988


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REC'D 29 JAN 2002

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TS 0919 PCT		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/09254	International filing date (day/month/year) 20/09/2000	Priority date (day/month/year) 21/09/1999	
International Patent Classification (IPC) or national classification and IPC C10J3/52			
Applicant SHELL INTERNATIONALE RESEARCH et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70 16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input checked="" type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 20/04/2001		Date of completion of this report 25.01.2002	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer  Rumbo, A  Telephone No. +49 89 2399 8407	



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09254

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, pages:

1,2,4,5,7-10	as originally filed		
3,3a,6,6a	as received on	14/09/2001 with letter of	13/09/2001

### Claims, No.:

1-10	as received on	14/09/2001 with letter of	13/09/2001
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### Drawings, sheets:

1	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09254

- ☐ the description,      pages:  
☐ the claims,      Nos.:  
☐ the drawings,      sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes: Claims 1-10
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-10
Industrial applicability (IA)	Yes: Claims 1-10
	No: Claims

2. Citations and explanations  
**see separate sheet**

## VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**



**SECTION VIII (CLARITY)**

1. The claimed subject-matter does not meet the requirements of Article 6 PCT. The wording of independent claim 1 does not contain all the technical features essential for the invention to be carried out.

All the technical features disclosed at page 7, at page 7, lines 20-21 are essential to the claimed invention to be carried out and should therefore be introduced within the wording of present claim 1 (see in particular: water which is poor in slag particles is pumped from the second vessel (2) into the first vessel (1)).

2. The technical features introduced within the wording of claim 8 do not completely reproduce the technical features supported by the description originally filed. In fact the terms "due to gravity" should be added thereto in order to complete the wording of present claim 8.

3. Failure to do as requested the clarity of the claimed subject-matter cannot be acknowledged.

**SECTION V (NOVELTY AND INVENTIVE STEP)**

1. The claimed subject-matter does not meet the requirements of Article 33(3) PCT.

The only differentiating technical feature present within the wording of the independent claim 1 in view of the closest prior art document D1=GB-A-2 086 931 (see in particular page 2 lines 85 to 90) consists in the presence of two vessels below the quenching instead of the only vessel disclosed in D1, since the disclosure of D1 concerns also the withdrawal of water from the hopper into the quench zone (see page 2, lines 93-95 and lines 111-116).

Nevertheless nowhere in the application originally filed has been demonstrated that such a differentiating technical feature could be solved as a consequence of the differentiating technical feature which could not have been solved by the technical features disclosed in D1.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP00/09254

The only evidence present in the originally filed document (see examples 1 and 2 on file) merely confirms the well-known effect disclosed in D1 consisting in the prevention of a formation of a blockage (see D1, page 2, lines 102-108) **and it is evident that having a water withdrawal from the hopper into the quench the discharge of particles is as easily performed as presently purported.**

In the absence of at least one differentiating technical feature present in the wording of the independent claim which solves a technical problem not previously solved by the disclosure of D1, the claimed subject-matter cannot be considered inventive. At present time nowhere in the application it is disclosed that a technical problem can be solved by technical means been different from those well known for the skilled person. The dependent claims contain technical features which are quite common in the technical field concerned (see D1 in its entirety).

In fact modifications which do not solve any technical problem can be considered as obvious for the skilled person and therefore not inventive according to Article 33(3) PCT.

finely dispersed solid carbon-containing fuel with an oxygen-containing gas, by

(a) discharging of the mixture from the quench zone to a first vessel,

5 (b) discharging slag particles from the first vessel to a second vessel and discharging water poor in solid slag from the second vessel, which second vessel is located below and fluidly connected to said first vessel by means of an open connecting conduit provided with pumping means  
10 and is further provided with closed means to discharge slag from its lower end,

(c) fluidly closing the first vessel from the second vessel,

(d) opening of the means to discharge slag from the  
15 second vessel to remove slag from the second vessel to a lower pressure zone, and

(e) closing the means to discharge slag from the second vessel and repeating steps (a) to (e).

By performing the process according the invention it  
20 is possible to discharge solid slag particles from a vessel containing a mixture of liquid and solid slag particles, wherein the amount of sulphur containing compounds being discharged together with the water is lower than in prior art processes. Less hydrogen sulphide  
25 will thus be discharged together with the slag particles. The hydrogen sulphide normally discharged together with the slag will now be discharged with the synthesis product gasses. Because the synthesis gasses typically contain a certain amount of hydrogen sulphide it will be  
30 no problem to remove this additional amount of hydrogen sulphide in the existing downstream hydrogen sulphide removal sections. Further advantages of the present process will become apparent when reading the detailed description of this invention.

In order to further reduce the amount of sulphur compounds which can be discharged from the first vessel to the second vessel it is advantageous to fill the second vessel with clean or fresh water after the slag particles are removed from the second vessel in step (d) and/or in step (e) before performing step (a). When slag particles enter the second vessel part of this clean water, having suitably about the volume of the entering particles, is discharged to the first vessel, or alternatively, but less preferred, to another outlet. When this clean water enters the first vessel a further reduction in this first vessel of the content of sulphur compounds results as also discussed above.

In a preferred embodiment of the present invention the first vessel is also provided with means to discharge water poor in slag. This is advantageous because slag particles can then more easily enter the first vessel from the quench zone. This water can advantageously be used as medium to cool the quench zone by extracting heat from this stream against cooling water, cooling air or another medium. Also it may be advantageously to use this water to destroy and/or clean deposits formed on the surface of the water layer present in the quench zone and deposits present on the quench zone construction itself. It may be advantageous to bleed some of this stream to prevent building up of contaminants. The preferred position at which the water poor in slag is discharged from the first vessel is the same as discussed for the second vessel.

The present process is very advantageous to be used in a situation wherein the pressure in the first vessel is higher than the pressure of the environment into which the separated solids are discharged to from the second vessel. In a gasification process the pressure in the quench zone and the associated first vessel in the

C L A I M S

1. Process to remove solid slag particles from a mixture of solid slag particles and water present in a quench zone, which quench zone is part of a process for the preparation of synthesis gas by partial combustion of finely dispersed solid carbon-containing fuel with an oxygen-containing gas, by
- 5 (a) discharging of the mixture from the quench zone to a first vessel,
- (b) discharging slag particles from the first vessel to a second vessel and discharging water poor in solid slag from the second vessel, which second vessel is located below and fluidly connected to said first vessel by means of an open connecting conduit provided with pumping means and is further provided with closed means to discharge slag from its lower end,
- 10 (c) fluidly closing the first vessel from the second vessel,
- (d) opening of the means to discharge slag from the second vessel to remove slag from the second vessel to a lower pressure zone, and
- 20 (e) closing the means to discharge slag from the second vessel and repeating steps (a) to (e).
2. Process according to claim 1, wherein the water poor in slag obtained in step (c) is supplied to the first vessel.
- 25 3. Process according to claim 2, wherein the water poor in slag is supplied to the lower end of a first vessel, which first vessel has a height over diameter ratio of more than three.

4. Process according to any one of claims 1-3, wherein in step (d) and/or in step (e) before performing step (a) fresh water is supplied to the second vessel.
5. Process according to any one of claims 1-4, wherein the water, which is poor in solids, is discharged from the upper part of the second vessel at a position away from the inlet opening of the first conduit entering the second vessel.
6. Process according to any one of claims 1-5, wherein the ratio of volume of water which is extracted from the second vessel relative to the volume of solid slag particles being transported to the second vessel in the same time period is between 0.7 and 1.5.
7. Process according to claim 6, wherein the ratio is between 0.8 and 1.
8. Process according to any one of claims 1-7, wherein fresh water is supplied to the second vessel during step (d) and/or (e) resulting in that the second vessel contains fresh water before step (b) is performed.
9. Process according to any one of claims 1-8, wherein water poor in slag is discharged from the first vessel.